Module Title:	Linux Infrastructure Engineering
Language of Instruction:	English

Credits:	5

NFQ Level:	8

Module Delivered In	4 programme(s)

Teaching & Learning Strategies:	Learners will develop knowledge, understanding and practical skills primarily through labs with supporting lectures in a lab environment where appropriate. Delivery of technical content will promote discovery learning, where hands-on practical workshops will be utilised to enable learners to apply knowledge and skills, supported by an instructor led, peer learning environment.

Module Aim:	Effectively design and implement a flexible and scalable computing infrastructure, suitable for a wide variety of environments by integrating cluster and container technology.

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	Summarise the functionality and benefits of cluster and container technology.
LO2	Synthesise a range of emerging and industry standard tools, as used in cluster and container technology.
LO3	Evaluate and implement an appropriate infrastructure using cluster and container technology in a given context.

Pre-requisite learning	
Module Recommendations *This is prior learning (or a practical skill) that is recommended before enrolment in this module.*	
No recommendations listed	
Incompatible Modules *These are modules which have learning outcomes that are too similar to the learning outcomes of this module.*	
No incompatible modules listed	
Co-requisite Modules	
No Co-requisite modules listed	
Requirements *This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.*	
Learners should have good knowledge of Operating Systems, Networks and be comfortable working in a command line environment (Linux and Windows).	

Module Content & Assessment

Indicative Content

Clusters
Intro to module and module content. Types of clusters, characteristics of clusters (fail-over, load balance, HPC) and tightly coupled nature of typical clusters. Task to build a POC cluster.

Private Cloud
Introduction to private cloud technology. Building of private cloud technology to deploy a 'self service' infrastructure capability, using open source technology e.g.OpenStack/OpenNebula.

Containers
Introduction to containers and container technology. Evolution of infrastructure/deployment environments to include containers. Container (e.g. Docker) on single node vs cluster environment to provision containers (Kubernetes). Examination of other implementations e.g. Linux containers (LXC/LXD).

Virtualisation and Orchestration
Examination of various tools and techniques are available for virtualisation and orchestration, determination of which are appropriate for specific cases.

Infrastructure as Code
Managing and provisioning compute resources through machine-readable definition files. Utilising IaC to deploy system infrastructure (IT Management), business continuity/disaster recovery (Cybercrime and IT Security) and rapid/scalable application hosting (Software Development).

Assessment Breakdown	%
Continuous Assessment	30.00%
Project	70.00%

Continuous Assessment

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	Practical Exam	2	30.00	Week 5

Project

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Project	Project	1,3	70.00	Week 12

No Practical

No End of Module Formal Examination

SETU Carlow Campus reserves the right to alter the nature and timings of assessment

Module Workload

Workload: Full Time		
Workload Type	*Frequency*	*Average Weekly Learner Workload*
Laboratory	12 Weeks per Stage	3.00
Independent Learning	15 Weeks per Stage	5.93
	Total Hours	125.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_KCCGD_B	Bachelor of Science (Honours) in Computer Games Development	8	Group Elective 1
CW_KCCYB_B	Bachelor of Science (Honours) in Cyber Crime and IT Security	8	Elective
CW_KCCIT_B	Bachelor of Science (Honours) in Information Technology Management	8	Group Elective 1
CW_KCSOF_B	Bachelor of Science (Honours) in Software Development	8	Group Elective 1